

WHAT IS CLAIMED IS:

1. A hydrocarbon sensor comprising:
an electrolyte body having a first electrolyte surface with a reference
electrode depending therefrom;
a metal oxide electrode body contained within the electrolyte body and
5 having a first electrode surface coplanar with the first electrolyte surface, wherein
the electrolyte body is compressed and sintered about the metal oxide electrode
body for intimate contact therebetween.
2. The hydrocarbon sensor according to Claim 1, where the metal oxide
electrode body is formed from $\text{La}_{1-x}\text{A}_x\text{CrO}_3$, where A is selected from the group
consisting of Sr, Ca, and Mg, and $0 \leq x \leq 0.5$.
3. The hydrocarbon sensor according to Claim 2, where A is Sr and
 $x=0.2$.
4. The hydrocarbon sensor according to Claim 1, where the electrolyte
body is yttria stabilized zirconia with a porosity produced by sintering at a
temperature effective to produce a density less than about 81% of theoretical
maximum density.
5. A method for forming a hydrocarbon sensor comprising:
forming a sintered metal-oxide electrode body;
placing the metal-oxide electrode body within an electrolyte powder;
pressing the electrolyte powder with the metal-oxide electrode body to form
5 a pressed electrolyte body containing the metal-oxide electrode body;
removing electrolyte from an electrolyte surface above the metal-oxide
electrode body to expose a metal-oxide electrode surface that is coplanar with the
electrolyte surface; and
sintering the electrolyte body with the metal-oxide electrode body to form
10 the hydrocarbon sensor.

6. The method of Claim 5, where the metal oxide electrode body is formed from $\text{La}_{1-x}\text{A}_x\text{CrO}_3$, where A is selected from the group consisting of Sr, Ca, and Mg, and $0 \leq x \leq 0.5$.
7. The method of Claim 6, where the A is Sr and $x=0.2$.
8. The method of Claim 5 where the electrolyte is yttria-stabilized zirconia.
9. The method of Claim 8, where the metal oxide electrode body is formed from $\text{La}_{1-x}\text{A}_x\text{CrO}_3$, where A is selected from the group consisting of Sr, Ca, and Mg, and $0 \leq x \leq 0.5$.
10. The method of Claim 9, where A is Sr and $x=0.2$.
11. The method of Claim 10, wherein the electrolyte body with the metal-oxide electrode body is sintered at a temperature effective to produce a density less than about 81% of theoretical density.